

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently amended) A method of producing a thick nonlinear optical grating with a thickness of several hundred microns from an initial thick nonlinear optical grating, ~~[[the]]~~ a thickness of the nonlinear optical grating being greater than ~~the thickness that~~ of the initial thick nonlinear optical grating, said initial thick nonlinear grating comprising at least ~~[[one]]~~ a plurality of mutually parallel plane layers, said layers having at least two nonlinear coefficients having ~~algebraically~~ different values, said initial thick nonlinear grating having a first face and a second face that are approximately parallel to each other and approximately perpendicular to the mean plane of the layers, and said second face being free, comprising:

a first step of determining the thickness of ~~[[that]]~~ an upper part of the initial thick nonlinear optical grating which lies beneath the second face, ~~which wherein the upper~~ part has structural imperfections;

a second step of polishing the second face of said initial thick nonlinear optical grating, making it possible to remove the upper part having said imperfections and to obtain a polished and plane third face, said face approximately perpendicular to the mean plane of the layers;

a third step of cleaning and checking said third face; and

at least a fourth step of epitaxially depositing at least one layer of material deposited on said third face, the epitaxial growth reproducing, in said deposited layer, a structure similar to that of the initial grating, the combination of the initial grating and said deposited layer constituting the nonlinear optical grating.

2. (Currently amended) The method of producing an optical grating as claimed in claim 1, wherein ~~the means of~~ the step of determining the thickness of the upper part of the initial grating having imperfections is performed by ~~[[are]]~~ optical display devices.

3. (Previously Presented) The method of producing a nonlinear optical grating as claimed in claim 1, wherein after the second production step, the thickness of the initial optical grating is at least 50 microns.

4. (Previously Presented) The method of producing a nonlinear optical grating as claimed in claim 1, wherein the initial nonlinear optical grating is supported by a seed substrate having a lower face and a plane upper face, the upper face of the seed substrate coinciding with the first face of said initial nonlinear optical grating.

5. (Previously Presented) The method of producing a nonlinear optical grating as claimed in claim 4, wherein the seed substrate comprises a crystalline material having a first crystal orientation, the upper face of the seed substrate having a thin structure, said structure being formed from a precursor grating of parallel bands of the same crystalline material but of the opposite orientation to that of the seed substrate.

6. (Previously Presented) The method of producing a nonlinear optical grating as claimed in claim 5, wherein the thickness of the seed substrate is at least 300 microns.

7. (Previously Presented) The method of producing an optical grating as claimed in claim 4, wherein said second step comprises the following preliminary steps:

a first preliminary step of polishing the lower face of the substrate; and

a second preliminary step of bonding at least said lower face to at least one plane support, the fitting of the support making it easier to handle the initial optical grating for the subsequent polishing operations.

8. (Previously Presented) The method of producing a nonlinear optical grating as claimed in claim 4, wherein the initial nonlinear optical grating is obtained by the epitaxial growth method called HVPE (hydride vapor phase epitaxy) on the upper face of the seed substrate.

9. (Previously Presented) The method of producing an optical grating as claimed in claim 1, wherein the method of producing the initial nonlinear optical grating comprises the following substeps:

a first substep of producing a stack of crystalline plates having plane parallel faces, of the same material, of small thickness and of periodically alternating crystal orientation; and

a second substep of assembling said crystalline plates so as to obtain a single monolithic assembly constituting the initial optical grating, said initial grating having a first face and a second face that are approximately perpendicular to the mean plane of the crystalline plates.

10. (Previously Presented) The method of producing an optical grating as claimed in claim 9, wherein said second step in the production of the initial grating is preceded by the following preliminary steps:

a first preliminary step of polishing the first face of the monolithic stack; and

a second preliminary step of bonding at least said first face to at least one plane support, the fitting of the support making it easier to handle the monolithic assembly for the subsequent operations of polishing the second face.

11. (Previously Presented) The method of producing an optical grating as claimed in claim 1, wherein, during said fourth step, at least two layers of materials of different optical index are deposited so as to form an optical waveguide.

12. (Previously Presented) The method of producing a nonlinear optical grating as claimed in claim 1, wherein during said fourth step, at least one of the layers is

obtained by the epitaxial growth method called OMCVD (organometallic chemical vapor deposition) or by MBE (molecular beam epitaxy).

13. (Previously Presented) The method of producing a nonlinear optical grating as claimed in claim 2, wherein after said second step, the thickness of the initial optical grating is at least 50 microns.